

INTRODUCTION

It's Science Fair time and students are expected to be researchers, scientists, authors, editors, and artists. Even though most children are not experts in these fields, they are expected to produce a project. This book, Show Me How To Write an Experimental Science Fair Paper, will provide students with a sample project, explanation section, and fill-in-the-blank page(s) for each assignment. Have you heard this before? Read on....this book has been field tested and it works! TRY IT! Make Science Fair easier!

SHOW ME HOW TO USE THIS BOOK

In the pages ahead, you will read about an experimental science fair project that investigated the problem, "WILL THE NUMBER OF PAPER CLIPS ON THE NOSE OF A PAPER AIRPLANE AFFECT THE DISTANCE THAT IT CAN FLY?" Beginning on the title page, and continuing through the bibliography page, you will see page numbers with letters "a" or "b."

On most of the "a" pages, you will find three sections: **SAMPLE**, **REMINDER**, and **EXPLANATION**. In the **SAMPLE** section, you will see how the paper airplane project was written. In the **EXPLANATION** section, you are given specific instructions on how to write your paper. The **REMINDER** section is written in a banner pulled by a biplane. Read the **REMINDER** section for important messages. The **REMINDER** section will let you know if you need two copies of a page, one for the booklet, and one for the backboard. If you need two copies of a page, do not write or type the page twice, use a copy machine for your second copy.

The "b" pages are the **FILL-IN-THE-BLANK** pages and are opposite the **SAMPLE** "a" pages. Most of the "b" pages have headings. Ten of the "b" pages have starter phrases that match phrases in the **SAMPLE** "a" sections. These phrases will help you know what to write in each paragraph. You may make photo copies of all the "b" pages for your own project.

On the "a" pages you will see words that have dashed, single, or double lines under them. These lines signify variables. When you see these lines, you are to write your variables for your project on a copy of the fill-in-the-blank pages. However, **YOU ARE NOT TO UNDERLINE YOUR VARIABLES IN YOUR PROJECT**. Underlining the variables was done to show you where to write them in your project. Variables are on eleven of the sixteen pages. It is very important that you understand what a variable is before you select your topic or design your experiment.

WHAT ARE VARIABLES?

Variables are the parts of the experiment that are either **kept the same, changed,** or are the **measure of the change.**

CONSTANT VARIABLES ARE THE PARTS OF THE TESTS THAT ARE KEPT THE SAME. The constant variables in the paper airplane project were: same size of paper, same kind of paper, same paper airplane design, same kind of paper clips, same breezeless place to fly the plane, the same starting line, fly the plane in the same manner, and use meters to measure how far the plane flies. The words that are underlined with dashes in the airplane project are the constant variables. (See the dashed underlined words in the sample project on pages 8a, 9a, 12a, 13a, 15a, 16a, 17a, 20a.)

THE INDEPENDENT VARIABLE IS THE THING THAT IS CHANGED AND TESTED. The independent variable in the sample airplane project was the number of paper clips used on the nose of the plane. The options chosen from the number of paper clips was: none, one, three, and five. The words that are underlined with a double line in the airplane project signify the independent variable. (See the double lined words in the sample project on pages: 8a, 9a, 12a, 13a, 14a, 15a, 16a, 17a, 18a, 19a, 20a.)

THE DEPENDENT VARIABLE IS THE MEASURE OF THE CHANGE. The dependent variable in the sample airplane project was the meter distance the plane flew. Deciding how to measure your test is a VERY IMPORTANT part of your project. The best way to collect data is to use numbers (grams, meters, milliliters, pounds, feet, cups, minutes, hours, days, etc.). When you measure the change with numbers, you are collecting data quantitatively (not qualitatively which is using people's opinions). The words that are underlined with a single line in the airplane project are the dependent variables. (See the single lined words in the sample project on pages: 8a, 9a, 12a, 13a, 14a, 15a, 16a, 17a, 18a, 19a, 20a.)

In the REMINDER banner you may see the following symbols: Ⓒ Ⓘ Ⓓ

These symbols will remind you that Ⓒ = constant variables and are identified with broken lines; Ⓘ = independent variables and are identified with double lines; and Ⓓ = dependent variables and are identified with single lines.

SELECTING A TOPIC

For many students, one of the most time consuming parts of the experimental project is selecting the topic. It is a challenge to decide on a topic that is original and interesting. An experiment can be done on many things. Topics do not have to be "science stuff"! In other words, you do not have to have tests tubes, microscopes, batteries, etc. Begin with your interests. Do you like sports? Run a test on techniques used in sports. Do you like cooking? Alter a recipe and measure the results. Do your parents work in a field in which a test could be run: building industry, art media, photography, etc.? Experiments can be conducted in many nonscience as well as science areas.

A more common way of selecting a topic is to find a topic, or an experiment, in a book from the science section of the library. If you find an interesting experiment, you can alter the experiment to make it different, or original, by changing the independent variable. Consider, for example, the experiment, "Will the number of paper clips on the nose of a paper airplane affect the distance that it can fly?" The independent variable was the number of paper clips on the nose of the paper airplane. The constant variables were: the same kind of paper, same size of paper, same airplane design, same kind of paper clips, same amount of thrust to fly the plane, same breezeless hallway, and same angle of release. By making one of the constant variables the independent variable, you can come up with several "new" experiments. For example:

1. Will the type of paper used to make a paper airplane affect the distance that it can fly? (construction paper, tissue paper, cardboard, typing paper)
2. Will the size of the paper used to make a paper airplane affect the distance that it can fly? (8" x 10", 4" x 5", 12" x 15")
3. Will the design of the paper airplane affect the distance that it can fly? (glider, dart, _____)
4. Will different amounts of thrust used to fly a paper airplane affect the distance that it can fly? (fast, slow, moderate speed)
5. Will different amounts of wind or air currents affect the distance a paper airplane can fly? (breezeless, low fan speed, high fan speed)
6. Will different angles of release affect the distance that a paper airplane can fly? (210°, 180°, 150°)
7. Will the placement of the paper clips on the plane affect the distance that the paper airplane can fly? (nose, tail, wing)

Once you have selected your topic, be sure you can answer the following questions. If you can, then you should have a good topic.

1. What is my independent variable? (part changed and tested)
2. What is my dependent variable? (number measurement of the change)
3. What are my constant variables? (parts kept the same for all tests)

USING THE TIMELINE

In the TIMELINE ASSIGNMENT chart, there are eleven due dates. Some of the due dates have more than one assignment. Some of the assignments are very easy. Some are more time consuming. The purpose of the timeline is to break up the big assignment into smaller parts. This way it is not an overwhelming task. As you work through the timeline assignments, you will notice that you are skipping around in the booklet. IT IS IMPORTANT THAT YOU FOLLOW THE ASSIGNMENT ORDER AS LISTED IN THE TIMELINE. The timeline is to be followed AFTER you have selected your topic. (Allow extra time for your project if you are growing plants.) The "Day" section in the timeline is a RECOMMENDED six week time to complete the project. Assignment #1 is due the first Monday; assignment #2 is due the following Monday; #3 is due two days later on Wednesday and so on.

TIMELINE ASSIGNMENTS

ASSIGNMENTS	PAGE	DAY	DUE DATE
1. Statement of the Problem	9	Monday	
2. Review of Literature and Bibliography	10, 11 22	Monday	
3. Hypothesis	12	Wednesday	
4. Variables	13	Friday	
5. Data Sheet	14 or 23	Monday	
6. Procedure of Investigation	15, 16	Monday	
7. <i>Use the data sheet to do the following:</i> Results Chart Graph	17 18 or 23 19 or 24	Friday	
8. Conclusion, Future	20, 21	Monday	
9. Abstract	8	Friday	
10. <i>Final Copy of Completed Notebook:</i> Title Acknowledgement Table of Contents	5 6 7	Monday	
11. Backboard and Display	25	Monday	

SAMPLE

FLYING PAPER AIRPLANES

A SCIENCE PAPER

PRESENTED TO

SCHOOL'S NAME

ELEMENTARY, MIDDLE OR JUNIOR HIGH SCHOOL

SCIENCE FAIR

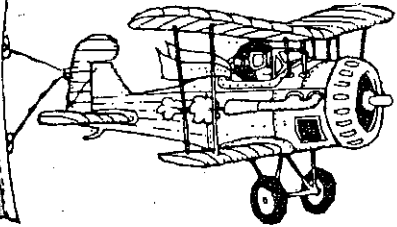
JUDGING DATE



REMINDER:

Do not write your name anywhere in or on
the booklet.

Judging is usually anonymous.



Explanation

Write the title of your project on the top three lines on this page. Write the name of your school on the middle lines. Write the judging date of the fair on the bottom line.

A SCIENCE PAPER

PRESENTED TO

SCIENCE FAIR

SAMPLE

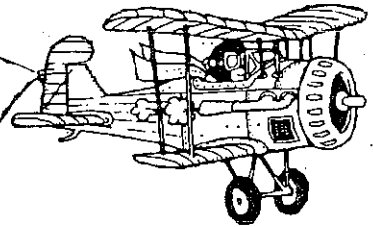
ACKNOWLEDGEMENT

I appreciate the help of my parents who took me to the library and helped me with my research. I want to thank my family for giving me the support and encouragement to complete my science fair project.



REMINDER:

You are almost finished with your project!



Explanation

On the acknowledgement page, you are thanking anyone who helped you with your project. It is a common courtesy to do so.

This is the only page in the booklet where you may use personal pronouns (examples: I, me, my, we, she, he, they, our, us, etc.). If you want to refer to yourself in the other pages of the booklet, use "the experimenter."

ACKNOWLEDGEMENT

I appreciate the help of _____

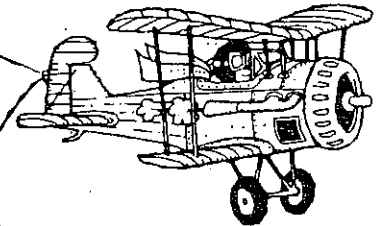
SAMPLE

TABLE OF CONTENTS

	page
I Abstract	1
II Statement of the Problem	2
III Review of Literature	3
IV Hypothesis	5
V Variables	6
VI Data Sheet	7
VII Procedure of Investigation	8
VIII Results	10
IX Chart	11
X Graph	12
XI Conclusion	13
XII Future Study	14
XIII Bibliography	15

REMINDER:

Numbering your booklet is almost the last thing
you will do for your notebook.



Explanation

After all of the pages are completed, put them in order. The order is the title page, acknowledgement, table of contents, abstract, etc. as listed in the table of contents. Begin numbering your pages at the top right corner of the page. Page 1 is the abstract page. The title page, acknowledgement, and the table of contents do not get a page number. When you are through numbering the pages, fill in the page numbers on your table of contents page. Then bind the booklet. Congratulations, you are finished!

TABLE OF CONTENTS

		page
I	Abstract	_____
II	Statement of the Problem	_____
III	Review of Literature	_____
IV	Hypothesis	_____
V	Variables	_____
VI	Data Sheet	_____
VII	Procedure of Investigation	_____
VIII	Results	_____
IX	Chart	_____
X	Graph	_____
XI	Conclusion	_____
XII	Future Study	_____
XIII	Bibliography	_____

SAMPLE

I ABSTRACT

1

The problem is, "Will the number of paper clips on the nose of a paper airplane affect the distance that it can fly?"

It is hypothesized that five paper clips on the nose of a paper airplane will make the plane fly farther than with none, one, or three paper clips on the plane's nose.

A brief procedure of the experiment is as follows. One plane was made according to the directions given in the Procedure of Investigation. This same plane was flight tested in the same breezeless hallway, using the same amount of thrust, and the same angle of release to fly the plane. The flight distances for each test was measured in meters. All tests were repeated for a total of three trials. That is, three tests for each of the following: no paper clips, one paper clip, three paper clips, and five paper clips. Data were taken and recorded.

The results do support the hypothesis.



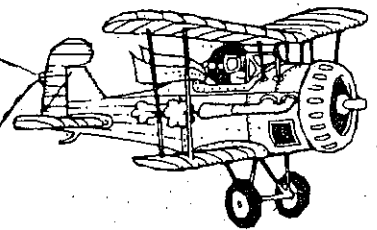
REMINDER:

This page is written near the end of the project.

C

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D



Explanation

This page may appear difficult to do, but it really isn't because all the information that is entered on this page has already been completed by the time you write this page. When you begin this page, you will have already written your hypothesis, problem, procedure, performed your experiments, and have your results. This page is the summary of your project.

I ABSTRACT

The problem is _____

It is hypothesized that _____

A brief procedure of the experiment is as follows.

The results _____ support the hypothesis.

SAMPLE

2

II STATEMENT OF THE PROBLEM

Will the number of paper clips on the nose of a paper airplane affect the distance that it can fly?



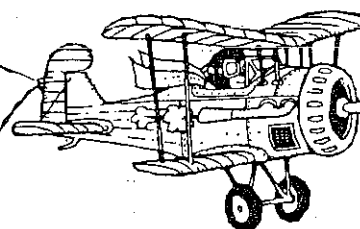
REMINDER:

You will need two copies, one for the booklet and one for the backboard.

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Explanation

Even though the problem is just one sentence, it is very important that it is written correctly. The independent and dependent variables are written in the problem. The independent variable is the variable that is changed and tested. The number of paper clips on the nose of the paper airplane is the independent variable for the sample project. The dependent variable is the measure of the change. In this project the dependent variable measures the flight distance of the plane in meters, with none, one, three, and five paper clips on the plane's nose.

The problem ends with a question mark. The problem will be written again in the Abstract.

II STATEMENT OF THE PROBLEM

SAMPLE

3

III REVIEW OF LITERATURE

Airplanes are much heavier than air. So what keeps them up in the air? There are four forces which act on a plane in flight. These forces are thrust, lift, drag, and gravity.

Thrust and lift are the forces which allows an airplane to fly. Thrust is caused by the engine's force which pushes the plane forward into the air. Air moving over the plane's wings causes lift.

The distance over the top of the wing of a plane is greater than the distance on the bottom of the wing. The air that flows over the top of the wing has farther to go than the air under the wing. The top air is spread out more, so it has less air pressure. The bottom air under the wing does not spread out so the air pressure is greater. Air moves from high to low pressure areas. Because air moves from high to low pressure areas, the plane is "lifted" upwards into the sky. It is this force of lift which keeps the plane in the air.

Planes have to come down from the air. Two forces cause this, drag and gravity. These two forces act against thrust and lift.

Drag is the friction in the air which slows down the plane. The plane will overcome the force of drag, or friction, as long as the thrust of the plane's engine is more powerful than the force of drag. But when the engine of the plane slows down, the force of thrust is reduced, and the force of drag takes over and slows down the moving plane.

Gravity is the force that causes matter to stay down or fall down. In order for a plane to fly, it must overcome the force of gravity. The force used to overcome gravity must be greater than the force of gravity. The force which acts against gravity is lift.

A glider is any plane that does not have a motor. When launching a glider, do not use too much force and see what it does. Too little weight on the nose of a glider may cause the glider to nose up and then plunge to the ground. This means that more weight will be needed.

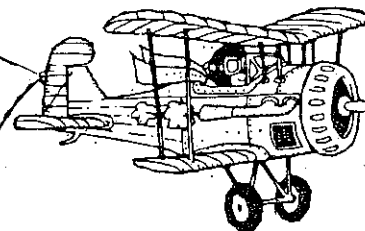
The paper airplane used in this project has the following parts: nose, wings, and fuselage (body) of the plane.

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or printed text on the paper.



REMINDER:

TALK TO AN EXPERT ON YOUR TOPIC, IT'S FUN!



Explanation

STEPS FOR WRITING A REVIEW OF LITERATURE

1. Make a list of everything that may pertain to your problem. (example, for the paper airplane project: air, plane, wings, gravity, lift, thrust, drag).
2. Find information on your word list in books, magazines, or talk to an expert on your topic. It is easier to find information in the indexes or table of contents of books. (You should use at least three books.)
3. From your research, decide what background information will be helpful to the judge. Not only does this help the judge understand your project, but it also lets the judge know that you are the expert in this study.
4. After you have selected the reading materials you are going to use from a book, write down the bibliography information. (See bibliography section, page 22.)
5. You may not copy information word for word from the books. You may rewrite the information in your own words.
6. Decide how many paragraphs you will need and then write your first copy of the Review of Literature. (rough draft copy)
7. Have someone proofread your paper to check for spelling, punctuation, sentence structure, grammar, etc.
8. Rewrite your rough draft into a perfect paper.

Students agree that this is the hardest part of the project. It takes many hours but it is necessary for you to understand your project. This knowledge strengthens your experiment.

Handwriting practice lines on a page with a large rectangular box containing 20 horizontal lines.

SAMPLE

5

IV HYPOTHESIS

Five paper clips on the nose of a paper airplane will make the plane fly farther than with none, one, or three paper clips on the plane's nose.



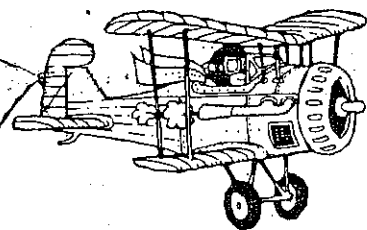
REMINDER:

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Explanation

The hypothesis is an educated guess concerning the outcome of the experiment. It contains the independent variable (thing changed and tested), and the dependent variable (measure of the change). Once you have determined your independent variable, decide on the options of that variable (see example in the next paragraph). Then select your hypothesis from one of your options.

In the sample project, the independent variable was the number of paper clips. The options chosen from the "number of paper clips" were: (a) five paper clips, (b) three paper clips, (c) one paper clip, or (d) no paper clips. In fact, the NO PAPER CLIPS option is the "control" option which means that the independent variable may not make a difference in the outcome of the experiment. You should include a "control" option in your experiment.

The hypothesis ends in a period. The hypothesis will be written again in the Conclusion and in the Abstract.

IV HYPOTHESIS

SAMPLE

V VARIABLES

6

The independent variable, which will be changed and tested, is the number of paper clips on the nose of the plane: none, one, three, or five.

The dependent variable will measure the change by recording the meter flight distance for every test.

The constant variables are the SAME for all tests: same size and kind of paper, same paper airplane pattern, same size and kind of paper clips, same breezeless hallway in which to fly the airplane, same starting line and meter distances marked off from the starting line, same amount of thrust to fly the plane, same angle of release, and same placement of paper clips.



REMINDER:

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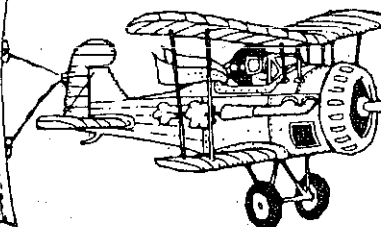
= constant variables (things kept the same)

I

= independent variable (thing changed and tested)

D

= dependent variable
(measure of the test)



Explanation

In order to have a valid test, only the ONE variable which is being tested will be changed. That variable is called the independent variable.

The dependent variable is the number measurement of the change. You should have a way to NUMERICALLY measure the results of your test (grams, meters, milliliters, pounds, feet, cups, hours, days, etc.).

The other variables must not change, they MUST BE EXACTLY THE SAME for all of the tests. These variables are called constant variables.

The constant variables will also be written on the procedure and the abstract pages. The independent and dependent variables will also be written in the problem, hypothesis, procedure, abstract, data sheet, chart, graph, results, and conclusion.

V VARIABLES

The independent variable, which will be changed and tested is _____

The dependent variable will measure the change by _____

The constant variables for all of the tests are the same: _____

SAMPLE

VI DATA SHEET

7

TEST NUMBER	INDEPENDENT VARIABLE	DEPENDENT VARIABLE
	no paper clips	meter distance plane flew
	1	0m
	2	1m
	3	0m
	AVERAGE OF THREE TESTS:	
		.3m

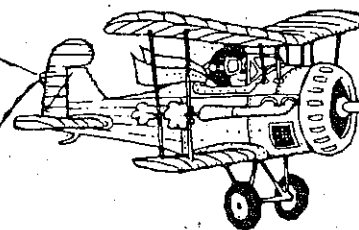
TEST NUMBER	INDEPENDENT VARIABLE	DEPENDENT VARIABLE
	one paper clip	meter distance plane flew
	1	0m
	2	0m
	3	1m
	AVERAGE OF THREE TESTS:	
		.3m

TEST NUMBER	INDEPENDENT VARIABLE	DEPENDENT VARIABLE
	three paper clips	meter distance plane flew
	1	8m
	2	7m
	3	5m
	AVERAGE OF THREE TESTS:	
		6.6m

TEST NUMBER	INDEPENDENT VARIABLE	DEPENDENT VARIABLE
	five paper clips	meter distance plane flew
	1	9m
	2	11m
	3	8m
	AVERAGE OF THREE TESTS:	
		9.3m

REMINDER:

If you will be collecting data over a period of time, use the data sheet form in the appendix.



Explanation

The data sheet should be made BEFORE you experiment. List each independent variable (thing changed and tested). How many tests are you going to conduct (at least three, the more, the better)? How are you measuring (dependent variable) your tests results? Remember to COLLECT DATA THAT CAN BE MEASURED WITH NUMBERS (quantitative data). Do not use people's opinions (qualitative data). RECORD YOUR DATA ON THE DATA SHEET AS IT OCCURS. Find the average for each independent variable by adding up the tests results and dividing the sum by the number of tests performed.

VI DATA SHEET

TEST NUMBER

INDEPENDENT VARIABLE	DEPENDENT VARIABLE
1	
2	
3	
AVERAGE OF THREE TESTS:	

TEST NUMBER

INDEPENDENT VARIABLE	DEPENDENT VARIABLE
1	
2	
3	
AVERAGE OF THREE TESTS:	

TEST NUMBER

INDEPENDENT VARIABLE	DEPENDENT VARIABLE
1	
2	
3	
AVERAGE OF THREE TESTS:	

TEST NUMBER

INDEPENDENT VARIABLE	DEPENDENT VARIABLE
1	
2	
3	
AVERAGE OF THREE TESTS:	

SAMPLE

VII PROCEDURE OF INVESTIGATION

8

MATERIALS USED

paper with paper airplane design, five paper clips, meter stick, masking tape, long breezeless hallway, pen, data sheet

PROCEDURE

To set up the experiment, make the paper airplane. Use the paper airplane pattern which is provided and fold on lines 1 and 2 towards the printed side of the paper. Fold in on line 3. Fold out on lines 4 and 5. For the first test, fly with no paper clips on the plane's nose. Use masking tape and a pen to tape and mark a starting line on the hall floor. From the starting line out, mark distances of 1 meter, 2 meters, 3 meters, etc., up to 20 meters.

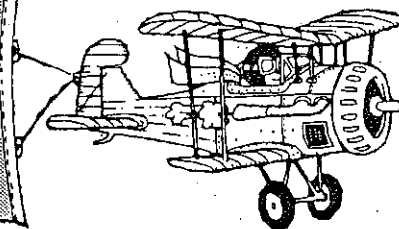
REMINDER:

Procedure continued on the next page.
See paper airplane in appendix.

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Explanation

It is easier to write your procedure AFTER you have performed your experiments because then you know exactly what steps you used to perform your tests. However, you do want to record your data while you are experimenting. When you write your procedure, BEGIN EACH SENTENCE WITH A VERB (example: fold, use, fly, aim, collect, conduct, repeat). DO NOT USE PERSONAL PRONOUNS (I, me, we, etc.).

STEPS FOR WRITING THE PROCEDURE OF INVESTIGATION

1. List all the materials that were used for the experiment under "Materials Used."
2. In "To set up the experiment," describe the preparations made before the actual testing began. Include the constant variables (parts kept the same). Be specific (see example).

VII PROCEDURE OF INVESTIGATION

MATERIALS USED

PROCEDURE

To set up the experiment _____

SAMPLE

Perform the experiment on the first independent variable:
paper airplane with no paper clips on the nose of the plane. Fly the plane
from the starting line. Aim the plane using the same angle of release and
the same amount of thrust or push for each flight test.

Collect the results for each test by observing where the plane lands and
recording the distance that it flies for each test on the data sheet.

Repeat the test two more times. Calculate and record the average of the three tests.

Repeat the same procedure for the remaining independent variables: one, three, and
five paper clips. When the entire experiment is finished, no paper clips, one, three, and
five paper clips should have been tested three times each for a total of twelve tests.



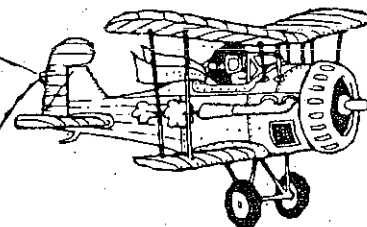
REMINDER:

Need two copies of all procedure pages!

C

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D



Explanation

STEPS FOR WRITING PROCEDURE OF INVESTIGATION

3. In "Perform the experiment on the first independent variable," identify the independent variable which you tested first. Describe exactly what you did to perform the test. Include the constant variables that apply to this section (see example).
4. In "Collect the results for each test by," identify the dependent variable (distance plane flies). Remember to collect data quantitatively (use numbers).
5. In "Repeat the test more times," tell how many tests you performed on your first independent variable. In "Calculate and record the average of the tests," identify the total number of tests performed on the first independent variable.
6. In "Repeat the same procedure for the remaining independent variables," identify the other independent variables which were tested (one, three, and five paper clips).

Perform the experiment on the first independent variable

Collect the results for each test by _____

Repeat the test _____ more times. Calculate and record the average for the _____ tests.

Repeat the same procedure for the remaining independent variables:

SAMPLE

10

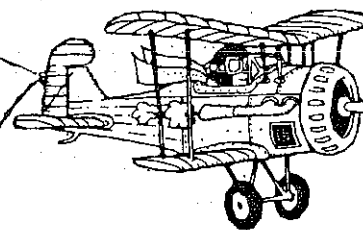
VIII RESULTS

The average results for each independent variable are as follows. The airplane with no paper clips on the the plane's nose flew an average distance of .3 meters. With one paper clip, the plane flew an average distance of .3 meters. With three paper clips, the plane flew an average distance of 5.6 meters. With five paper clips, the plane flew an average distance of 9.3 meters.



REMINDER:

Need two copies of this page, one for the booklet and one for the backboard!



Explanation

In the results, GIVE ONLY THE AVERAGE RESULTS of the tests performed on each independent variable. To find the average, add up the tests results for each independent variable and divide by the number of tests that were performed.

VIII RESULTS

The average results for each independent variable are as follows. _____

SAMPLE

IX CHART

FLIGHT TEST RESULTS

11

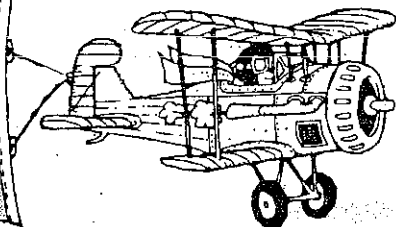
INDEPENDENT VARIABLE
NUMBER OF PAPER CLIPS

DEPENDENT VARIABLE
METER DISTANCE PLANE FLEW

	TEST 1	TEST 2	TEST 3	AVERAGE
<u>no paper clips</u>	0m	1m	0m	.3m
<u>one paper clip</u>	0m	0m	1m	.3m
<u>three paper clips</u>	8m	7m	5m	6.6m
<u>five paper clips</u>	9m	11m	8m	9.3m

REMINDER:

If you have collected data over a period of time,
use the chart in the appendix. Need two copies.

**Explanation**

Design your chart according to the number of independent variables and the number of tests performed on your project. Above the chart, write the independent and dependent variables. In the chart, write all of the independent variables. Also, list all tests results and averages which you recorded on your data sheet while experimenting. Your chart's title should refer to the dependent variable.

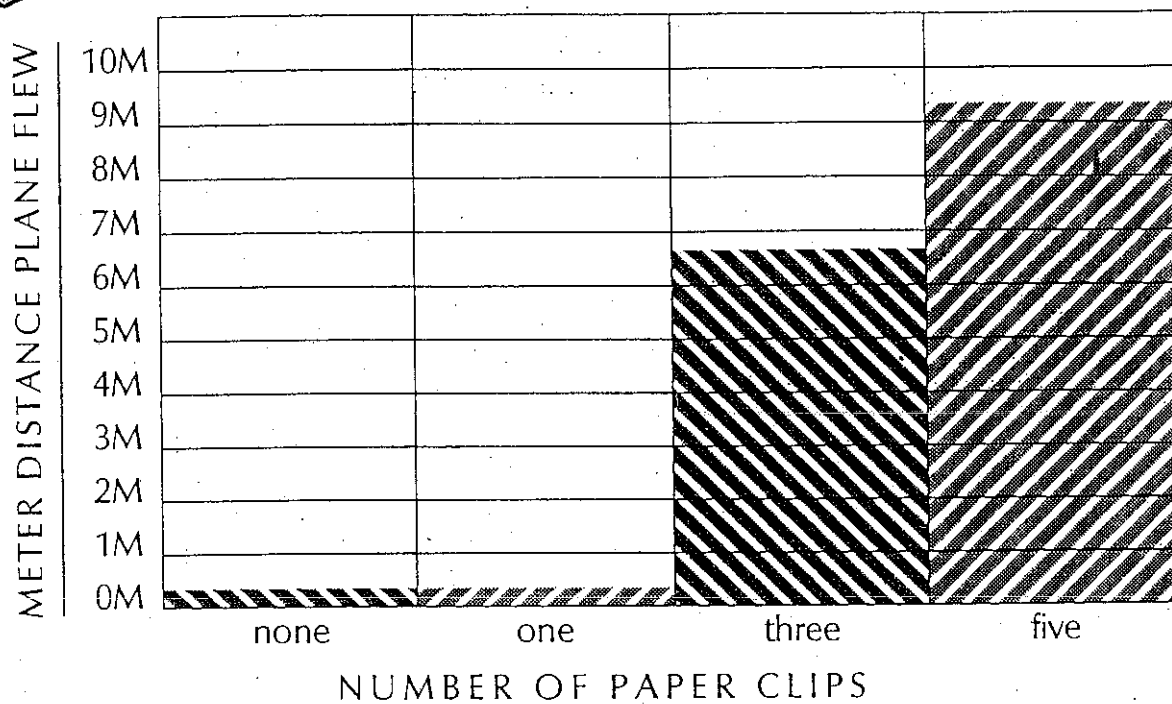
IX CHART

SAMPLE

X GRAPH

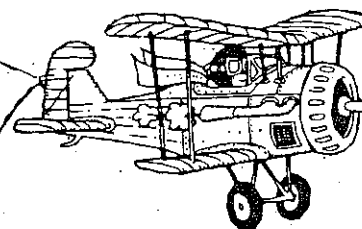
12

AVERAGE FLIGHT DISTANCES



REMINDER:

If you collected data over a period of time, use the graph in the appendix. Need two copies of the graph.



Explanation

This is a bar graph. Design your bar graph according to the number of independent variables and the kind of measurement (dependent variable) that you used. List the independent variables for your project at the bottom of your graph. Place your dependent variable (measurement) on the left side of the graph. It is easier to graph the averages than it is to graph all of the tests results. The title should refer to the average of the dependent variable.

X GRAPH

SAMPLE

XI CONCLUSION

13

The hypothesis was that five paper clips on the nose of a paper airplane will make the plane fly farther than with none, one, or three paper clips on the plane's nose.

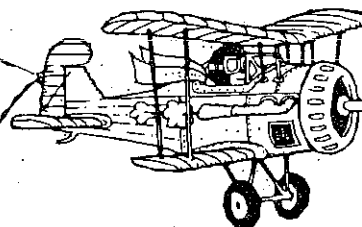
The results showed that five paper clips on the nose of the plane enabled the plane to fly farther than with none, one, or three paper clips on the plane's nose.

Therefore, the hypothesis was supported.



REMINDER:

Need two copies of this page, one for the booklet and one for the backboard.



Explanation

In the conclusion, restate the hypothesis in the first sentence. In "The results showed," be as brief as possible about what happened. State whether the hypothesis **was, or was not, supported**.

Never state that the hypothesis was "proved" true or false. A few tests cannot "prove" anything. It takes scientists many years of experimenting to "prove" something.

XI CONCLUSION

The hypothesis was _____

The results showed _____

Therefore, the hypothesis _____ supported.

XII FUTURE STUDY

The experimenter would like to find out if the type of paper used to make the plane will affect the distance that a paper airplane can fly. The planes will be made from the same size paper, have with the same number and kind of paper clips on the plane's nose, and use the same folding pattern.



REMINDER:

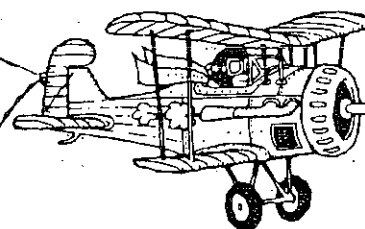
C

= constant variables (things kept the same)

I

= independent variable (thing changed and tested)

D

= dependent variable
(measure of the test)

Explanation

Now that your project is finished, tell your reader what your next step would be if you continued this study. A suggestion is to make the independent variable of your project a constant variable (example: same number of paper clips on the plane's nose for all tests, five paper clips). Then take one of your constant variables and make it the independent variable (example: type of paper used to make the plane: tag board, typing paper, construction paper, or tissue paper). See *Selecting a Topic*, numbers 1-7, page 3.

SAMPLE

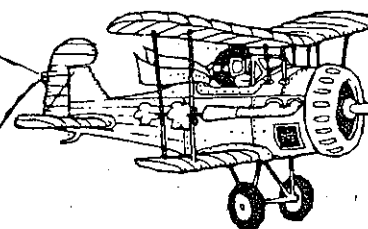
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15

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REMINDER:

Alphabetize sources of information.
Begin each source on margin line and indent
remaining lines.



Explanation

- BOOK** Author's Last Name, First Name. Title. Publisher, place where published, copyright date, pages used. (see bibliography above: Bendick, Jeanne.)
- ENCYCLOPEDIA** "Entry Word", Encyclopedia. Publisher, place where published, copyright date, volume number, pages used. (see above: "How an Airplane Flies")
- PERIODICAL** Author's Last Name, First Name. "Title of Article", Name of (magazine) Periodical. copyright date, volume number, pages used.
- EXPERT** Last Name, First Name. Occupation. City, State, Date of on your topic Contact. (see above: Fisher, Gilbert.)

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